

IAEA Safety Standards

for protecting people and the environment

Disposal of Radioactive Waste

Specific Safety Requirements No. SSR-5



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Under the terms of Article III of its Statute, the IAEA is authorized to establish or adopt standards of safety for protection of health and minimization of danger to life and property, and to provide for the application of these standards.

The publications by means of which the IAEA establishes standards are issued in the **IAEA Safety Standards Series**. This series covers nuclear safety, radiation safety, transport safety and waste safety. The publication categories in the series are **Safety Fundamentals**, **Safety Requirements** and **Safety Guides**.

Information on the IAEA's safety standards programme is available at the IAEA Internet site

<http://www-ns.iaea.org/standards/>

The site provides the texts in English of published and draft safety standards. The texts of safety standards issued in Arabic, Chinese, French, Russian and Spanish, the IAEA Safety Glossary and a status report for safety standards under development are also available. For further information, please contact the IAEA at PO Box 100, 1400 Vienna, Austria.

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DISPOSAL OF RADIOACTIVE WASTE



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The Agency's Statute was approved on 23 October 1956 by the Conference on the Statute of the IAEA held at United Nations Headquarters, New York; it entered into force on 29 July 1957. The Headquarters of the Agency are situated in Vienna. Its principal objective is "to accelerate and enlarge the contribution of atomic energy to peace, health and prosperity throughout the world".

IAEA SAFETY STANDARDS SERIES No. SSR-5

DISPOSAL OF RADIOACTIVE WASTE

SPECIFIC SAFETY REQUIREMENTS

This publication includes a CD-ROM containing the IAEA Safety Glossary: 2007 Edition (2007) and the Fundamental Safety Principles (2006), each in Arabic, Chinese, English, French, Russian and Spanish versions.

The CD-ROM is also available for purchase separately.

See: <http://www-pub.iaea.org/MTCD/publications/publications.asp>

INTERNATIONAL ATOMIC ENERGY AGENCY
VIENNA, 2011

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Marketing and Sales Unit, Publishing Section
International Atomic Energy Agency
Vienna International Centre
PO Box 100
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FOREWORD

by Yukiya Amano
Director General

The IAEA's Statute authorizes the Agency to "establish or adopt... standards of safety for protection of health and minimization of danger to life and property" — standards that the IAEA must use in its own operations, and which States can apply by means of their regulatory provisions for nuclear and radiation safety. The IAEA does this in consultation with the competent organs of the United Nations and with the specialized agencies concerned. A comprehensive set of high quality standards under regular review is a key element of a stable and sustainable global safety regime, as is the IAEA's assistance in their application.

The IAEA commenced its safety standards programme in 1958. The emphasis placed on quality, fitness for purpose and continuous improvement has led to the widespread use of the IAEA standards throughout the world. The Safety Standards Series now includes unified Fundamental Safety Principles, which represent an international consensus on what must constitute a high level of protection and safety. With the strong support of the Commission on Safety Standards, the IAEA is working to promote the global acceptance and use of its standards.

Standards are only effective if they are properly applied in practice. The IAEA's safety services encompass design, siting and engineering safety, operational safety, radiation safety, safe transport of radioactive material and safe management of radioactive waste, as well as governmental organization, regulatory matters and safety culture in organizations. These safety services assist Member States in the application of the standards and enable valuable experience and insights to be shared.

Regulating safety is a national responsibility, and many States have decided to adopt the IAEA's standards for use in their national regulations. For parties to the various international safety conventions, IAEA standards provide a consistent, reliable means of ensuring the effective fulfilment of obligations under the conventions. The standards are also applied by regulatory bodies and operators around the world to enhance safety in nuclear power generation and in nuclear applications in medicine, industry, agriculture and research.

Safety is not an end in itself but a prerequisite for the purpose of the protection of people in all States and of the environment — now and in the future. The risks associated with ionizing radiation must be assessed and controlled without unduly limiting the contribution of nuclear energy to equitable and sustainable development. Governments, regulatory bodies and operators everywhere must ensure that nuclear material and radiation sources are used beneficially, safely and ethically. The IAEA safety standards are designed to facilitate this, and I encourage all Member States to make use of them.

DISCLAIMER

The IAEA safety standards reflect an international consensus on what constitutes a high level of safety for protecting people and the environment from harmful effects of ionizing radiation. The process of developing, reviewing and establishing the IAEA standards involves the IAEA Secretariat and all Member States, many of which are represented on the four IAEA safety standards committees and the IAEA Commission on Safety Standards.

The IAEA standards, as a key element of the global safety regime, are kept under regular review by the Secretariat, the safety standards committees and the Commission on Safety Standards. The Secretariat gathers information on experience in the application of the IAEA standards and information gained from the follow-up of events for the purpose of ensuring that the standards continue to meet users' needs. The present publication reflects feedback and experience accumulated until 2010 and it has been subject to the rigorous review process for standards.

The accident at the Fukushima Daiichi nuclear power plant in Japan caused by the disastrous earthquake and tsunami of 11 March 2011 and the consequences of the emergency for people and the environment have to be fully investigated. They are already under study in Japan, at the IAEA and elsewhere. Lessons to be learned for nuclear safety and radiation protection and for emergency preparedness and response will be reflected in IAEA safety standards as they are revised and issued in the future.

THE IAEA SAFETY STANDARDS

BACKGROUND

Radioactivity is a natural phenomenon and natural sources of radiation are features of the environment. Radiation and radioactive substances have many beneficial applications, ranging from power generation to uses in medicine, industry and agriculture. The radiation risks to workers and the public and to the environment that may arise from these applications have to be assessed and, if necessary, controlled.

Activities such as the medical uses of radiation, the operation of nuclear installations, the production, transport and use of radioactive material, and the management of radioactive waste must therefore be subject to standards of safety.

Regulating safety is a national responsibility. However, radiation risks may transcend national borders, and international cooperation serves to promote and enhance safety globally by exchanging experience and by improving capabilities to control hazards, to prevent accidents, to respond to emergencies and to mitigate any harmful consequences.

States have an obligation of diligence and duty of care, and are expected to fulfil their national and international undertakings and obligations.

International safety standards provide support for States in meeting their obligations under general principles of international law, such as those relating to environmental protection. International safety standards also promote and assure confidence in safety and facilitate international commerce and trade.

A global nuclear safety regime is in place and is being continuously improved. IAEA safety standards, which support the implementation of binding international instruments and national safety infrastructures, are a cornerstone of this global regime. The IAEA safety standards constitute a useful tool for contracting parties to assess their performance under these international conventions.

THE IAEA SAFETY STANDARDS

The status of the IAEA safety standards derives from the IAEA's Statute, which authorizes the IAEA to establish or adopt, in consultation and, where appropriate, in collaboration with the competent organs of the United Nations and with the specialized agencies concerned, standards of safety for protection

of health and minimization of danger to life and property, and to provide for their application.

With a view to ensuring the protection of people and the environment from harmful effects of ionizing radiation, the IAEA safety standards establish fundamental safety principles, requirements and measures to control the radiation exposure of people and the release of radioactive material to the environment, to restrict the likelihood of events that might lead to a loss of control over a nuclear reactor core, nuclear chain reaction, radioactive source or any other source of radiation, and to mitigate the consequences of such events if they were to occur. The standards apply to facilities and activities that give rise to radiation risks, including nuclear installations, the use of radiation and radioactive sources, the transport of radioactive material and the management of radioactive waste.

Safety measures and security measures¹ have in common the aim of protecting human life and health and the environment. Safety measures and security measures must be designed and implemented in an integrated manner so that security measures do not compromise safety and safety measures do not compromise security.

The IAEA safety standards reflect an international consensus on what constitutes a high level of safety for protecting people and the environment from harmful effects of ionizing radiation. They are issued in the IAEA Safety Standards Series, which has three categories (see Fig. 1).

Safety Fundamentals

Safety Fundamentals present the fundamental safety objective and principles of protection and safety, and provide the basis for the safety requirements.

Safety Requirements

An integrated and consistent set of Safety Requirements establishes the requirements that must be met to ensure the protection of people and the environment, both now and in the future. The requirements are governed by the objective and principles of the Safety Fundamentals. If the requirements are not met, measures must be taken to reach or restore the required level of safety. The format and style of the requirements facilitate their use for the establishment, in a harmonized manner, of a national regulatory framework. Requirements, including numbered ‘overarching’ requirements, are expressed

¹ See also publications issued in the IAEA Nuclear Security Series.

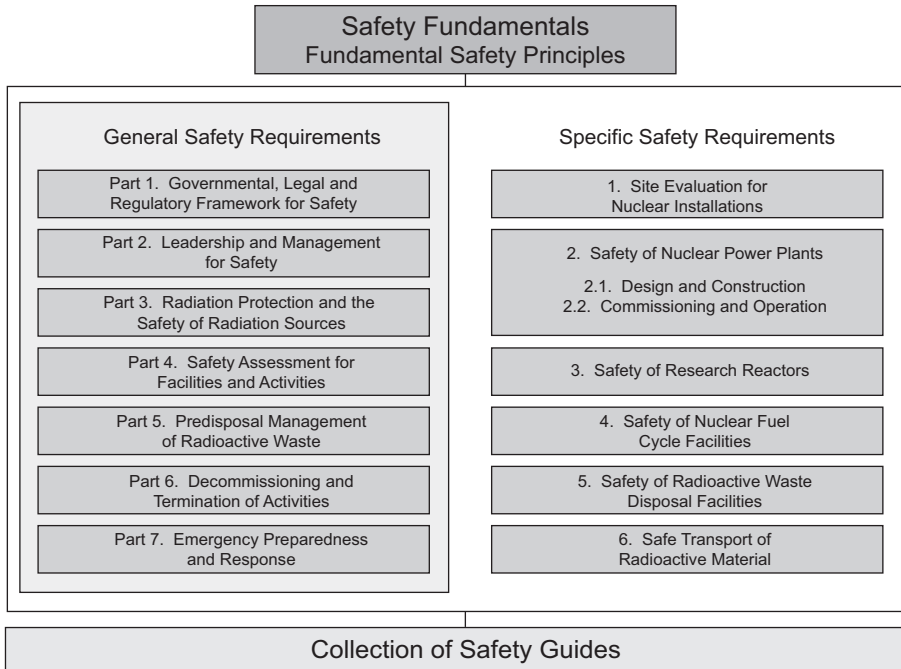


FIG. 1. The long term structure of the IAEA Safety Standards Series.

as ‘shall’ statements. Many requirements are not addressed to a specific party, the implication being that the appropriate parties are responsible for fulfilling them.

Safety Guides

Safety Guides provide recommendations and guidance on how to comply with the safety requirements, indicating an international consensus that it is necessary to take the measures recommended (or equivalent alternative measures). The Safety Guides present international good practices, and increasingly they reflect best practices, to help users striving to achieve high levels of safety. The recommendations provided in Safety Guides are expressed as ‘should’ statements.

APPLICATION OF THE IAEA SAFETY STANDARDS

The principal users of safety standards in IAEA Member States are regulatory bodies and other relevant national authorities. The IAEA safety

standards are also used by co-sponsoring organizations and by many organizations that design, construct and operate nuclear facilities, as well as organizations involved in the use of radiation and radioactive sources.

The IAEA safety standards are applicable, as relevant, throughout the entire lifetime of all facilities and activities — existing and new — utilized for peaceful purposes and to protective actions to reduce existing radiation risks. They can be used by States as a reference for their national regulations in respect of facilities and activities.

The IAEA's Statute makes the safety standards binding on the IAEA in relation to its own operations and also on States in relation to IAEA assisted operations.

The IAEA safety standards also form the basis for the IAEA's safety review services, and they are used by the IAEA in support of competence building, including the development of educational curricula and training courses.

International conventions contain requirements similar to those in the IAEA safety standards and make them binding on contracting parties. The IAEA safety standards, supplemented by international conventions, industry standards and detailed national requirements, establish a consistent basis for protecting people and the environment. There will also be some special aspects of safety that need to be assessed at the national level. For example, many of the IAEA safety standards, in particular those addressing aspects of safety in planning or design, are intended to apply primarily to new facilities and activities. The requirements established in the IAEA safety standards might not be fully met at some existing facilities that were built to earlier standards. The way in which IAEA safety standards are to be applied to such facilities is a decision for individual States.

The scientific considerations underlying the IAEA safety standards provide an objective basis for decisions concerning safety; however, decision makers must also make informed judgements and must determine how best to balance the benefits of an action or an activity against the associated radiation risks and any other detrimental impacts to which it gives rise.

DEVELOPMENT PROCESS FOR THE IAEA SAFETY STANDARDS

The preparation and review of the safety standards involves the IAEA Secretariat and four safety standards committees, for nuclear safety (NUSSC), radiation safety (RASSC), the safety of radioactive waste (WASSC) and the safe transport of radioactive material (TRANSSC), and a Commission on Safety Standards (CSS) which oversees the IAEA safety standards programme (see Fig. 2).

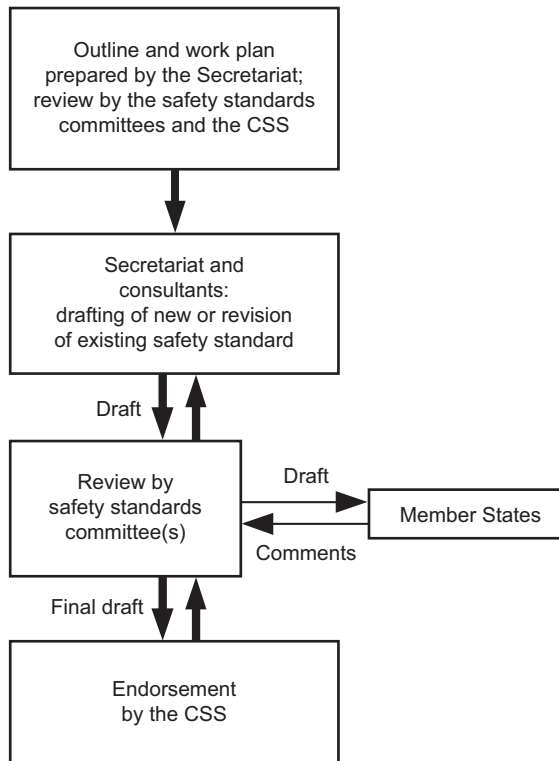


FIG. 2. The process for developing a new safety standard or revising an existing standard.

All IAEA Member States may nominate experts for the safety standards committees and may provide comments on draft standards. The membership of the Commission on Safety Standards is appointed by the Director General and includes senior governmental officials having responsibility for establishing national standards.

A management system has been established for the processes of planning, developing, reviewing, revising and establishing the IAEA safety standards. It articulates the mandate of the IAEA, the vision for the future application of the safety standards, policies and strategies, and corresponding functions and responsibilities.

INTERACTION WITH OTHER INTERNATIONAL ORGANIZATIONS

The findings of the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR) and the recommendations of international

expert bodies, notably the International Commission on Radiological Protection (ICRP), are taken into account in developing the IAEA safety standards. Some safety standards are developed in cooperation with other bodies in the United Nations system or other specialized agencies, including the Food and Agriculture Organization of the United Nations, the United Nations Environment Programme, the International Labour Organization, the OECD Nuclear Energy Agency, the Pan American Health Organization and the World Health Organization.

INTERPRETATION OF THE TEXT

Safety related terms are to be understood as defined in the IAEA Safety Glossary (see <http://www-ns.iaea.org/standards/safety-glossary.htm>). Otherwise, words are used with the spellings and meanings assigned to them in the latest edition of The Concise Oxford Dictionary. For Safety Guides, the English version of the text is the authoritative version.

The background and context of each standard in the IAEA Safety Standards Series and its objective, scope and structure are explained in Section 1, Introduction, of each publication.

Material for which there is no appropriate place in the body text (e.g. material that is subsidiary to or separate from the body text, is included in support of statements in the body text, or describes methods of calculation, procedures or limits and conditions) may be presented in appendices or annexes.

An appendix, if included, is considered to form an integral part of the safety standard. Material in an appendix has the same status as the body text, and the IAEA assumes authorship of it. Annexes and footnotes to the main text, if included, are used to provide practical examples or additional information or explanation. Annexes and footnotes are not integral parts of the main text. Annex material published by the IAEA is not necessarily issued under its authorship; material under other authorship may be presented in annexes to the safety standards. Extraneous material presented in annexes is excerpted and adapted as necessary to be generally useful.

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1. INTRODUCTION

BACKGROUND

General

1.1. Radioactive waste arises from the generation of electricity in nuclear power plants, from nuclear fuel cycle operations and from activities in which radioactive material is used. It also arises from activities and processes in which radioactive material of natural origin becomes concentrated in waste material and safety needs to be considered in its management. Radioactive waste can be generated by a wide range of activities varying from activities in hospitals to nuclear power plants to mines and mineral processing facilities.

1.2. The properties of radioactive waste are likewise varied, not only in terms of radioactive content and activity concentration but also in terms of physical and chemical properties. Its rate of generation is also varied. A common characteristic of all radioactive waste is its potential to present a hazard to people and to the environment, and it must, therefore, be managed so as to reduce any associated risks to acceptable levels. The potential hazard can range from large to trivial: a variation reflected in the management and disposal options necessary for various types of waste.

1.3. The safety principles to be applied in all activities for radioactive waste management are set out in the IAEA Safety Fundamentals [1]. These principles also form the ethical and conceptual basis for the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management [2]. The requirements for radiation protection are set out in the International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources (the International Basic Safety Standards) [3]. Many of the safety requirements and concepts of protection adopted in the standards and in the Joint Convention [2] derive from the recommendations of the International Commission on Radiological Protection (ICRP) [4–7].

1.4. This Safety Requirements publication establishes safety requirements relating to the disposal of radioactive waste of all types. It sets out the safety objective and criteria for the protection of people and the environment against radiation risks arising from disposal facilities for radioactive waste in operation and after closure. In order to meet the criteria, measures may need to be taken in site selection and evaluation and in the design, construction, operation and

closure of the disposal facility. The requirements are essential from a safety perspective and failure to meet any of the requirements would require action to be taken.

1.5. This Safety Requirements publication does not reiterate all the safety requirements in respect of the governmental, legal and regulatory framework, radiation protection and emergency planning that are established in other Safety Requirements publications. It is based on the premise that, in general, arrangements have to be in place to ensure that these related requirements are met. This Safety Requirements publication does set out some requirements that are closely related to these other thematic areas and which are of particular importance to the safety of radioactive waste disposal facilities. Guidance on the fulfilment of the safety requirements set out in this Safety Requirements publication is provided in several Safety Guides specific to different types of radioactive waste disposal facility.

1.6. The preferred strategy for the management of all radioactive waste is to contain it (i.e. to confine the radionuclides to within the waste matrix, the packaging and the disposal facility) and to isolate it from the accessible biosphere. This strategy does not preclude the discharge (i.e. controlled release) of effluents, arising from waste management activities, that contain residual amounts of radionuclides, or the clearance of materials that meet the relevant criteria. International safety standards have been established covering both of these circumstances [8, 9].

1.7. Radioactive waste may arise initially in various gaseous, liquid and solid forms. In waste management activities, the waste is generally processed to produce stable and solid forms, and reduced in volume and immobilized, as far as practicable, to facilitate their storage, transport and disposal. This Safety Requirements publication is concerned with the stage of disposal of solid or solidified materials, which is the last step in the process of radioactive waste management.

Concepts relating to disposal (and storage) of radioactive waste

1.8. The term ‘disposal’ refers to the emplacement of radioactive waste into a facility or a location with no intention of retrieving the waste¹. Disposal options are designed to contain the waste by means of passive engineered and natural features and to isolate it from the accessible biosphere to the extent necessitated by the associated hazard. The term disposal implies that retrieval is not intended; it does not mean that retrieval is not possible.

1.9. By contrast, the term ‘storage’ refers to the retention of radioactive waste in a facility or a location with the intention of retrieving the waste. Both options, disposal and storage, are designed to contain waste and to isolate it from the accessible biosphere to the extent necessary. The important difference is that storage is a temporary measure following which some future action is planned. This may include further conditioning or packaging of the waste and, ultimately, its disposal. Guidance on the safe storage of radioactive waste is provided in Ref. [11].

1.10. A number of design options for disposal facilities have been developed and various types of disposal facility have been constructed in many States and are in operation. These design options have different degrees of containment and isolation capability appropriate to the radioactive waste that they will receive. The specific aims of disposal are:

- (a) To contain the waste;
- (b) To isolate the waste from the accessible biosphere and to reduce substantially the likelihood of, and all possible consequences of, inadvertent human intrusion² into the waste;
- (c) To inhibit, reduce and delay the migration of radionuclides at any time from the waste to the accessible biosphere;
- (d) To ensure that the amounts of radionuclides reaching the accessible biosphere due to any migration from the disposal facility are such that possible radiological consequences are acceptably low at all times.

¹ Terminology used in this publication is defined and explained in the IAEA Safety Glossary [10] (see <http://www-ns.iaea.org/standards/safety-glossary.htm>).

² ‘Human intrusion’ refers to human actions that affect the integrity of a disposal facility and which could potentially give rise to radiological consequences. Only those human actions that result in direct disturbance of the disposal facility (i.e. the waste itself, the contaminated near field or the engineered barrier materials) are considered.

1.11. The balance between the importance of each of the above mentioned aims and the extent to which and the way in which they are accomplished will vary, depending on the characteristics of the waste and the type of disposal facility.

1.12. Disposal facilities are not expected to provide complete containment and isolation of waste over all time; this is neither practicable nor necessitated by the hazard associated with waste, which declines with time.

Types of disposal facility for radioactive waste

1.13. As indicated in para. 1.10, a number of design options for disposal facilities have been developed and various types of disposal facility have been constructed and are in operation around the world.

1.14. Within any State or region, a number of disposal facilities of different designs may be required in order to accommodate radioactive waste of various types. The classification of radioactive waste is discussed in an IAEA Safety Guide [12] and the different classes of radioactive waste are presented in the Annex. The following disposal options have been adopted in one or more States, corresponding to recognized classes of radioactive waste:

- (a) Specific landfill disposal: Disposal in a facility similar to a conventional landfill facility for industrial refuse but which may incorporate measures to cover the waste. Such a facility may be designated as a disposal facility for very low level radioactive waste (VLLW) with low concentrations or quantities of radioactive content [12]. Typical waste disposed of in a facility of this type may include soil and rubble arising from decommissioning activities.
- (b) Near surface disposal: Disposal in a facility consisting of engineered trenches or vaults constructed on the ground surface or up to a few tens of metres below ground level. Such a facility may be designated as a disposal facility for low level radioactive waste (LLW) [12].
- (c) Disposal of intermediate level waste: Depending on its characteristics, intermediate level radioactive waste (ILW) can be disposed of in different types of facility [12]. Disposal could be by emplacement in a facility constructed in caverns, vaults or silos at least a few tens of metres below ground level and up to a few hundred metres below ground level. It could include purpose built facilities and facilities developed in or from existing mines. It could also include facilities developed by drift mining into mountainsides or hillsides, in which case the overlying cover could be more than 100 m deep.

- (d) Geological disposal: Disposal in a facility constructed in tunnels, vaults or silos in a particular geological formation (e.g. in terms of its long term stability and its hydrogeological properties) at least a few hundred metres below ground level. Such a facility could be designed to receive high level radioactive waste (HLW) [12], including spent fuel if it is to be treated as waste. However, with appropriate design, a geological disposal facility could receive all types of radioactive waste.
- (e) Borehole disposal: Disposal in a facility consisting of an array of boreholes, or a single borehole, which may be between a few tens of metres up to a few hundreds of metres deep. Such a borehole disposal facility is designed for the disposal of only relatively small volumes of waste, in particular disused sealed radioactive sources. A design option for very deep boreholes, several kilometres deep, has been examined for the disposal of solid high level waste and spent fuel, but this option has not been adopted for a disposal facility by any State.
- (f) Disposal of mining and mineral processing waste: Disposal usually on or near the ground surface, but the manner and the large volumes in which the waste arises, its physicochemical form and its content of long lived radionuclides of natural origin distinguish it from other radioactive waste. The waste is generally stabilized in situ and covered with various layers of rock and soil.

1.15. This Safety Requirements publication applies to all of the above mentioned types of disposal and disposal facilities. Comprehensive guidance on meeting the requirements established in this Safety Requirements publication is given in IAEA Safety Guides, in each of which a particular type of disposal, as described above, is considered.

1.16. In accordance with the graded approach, as required in the International Basic Safety Standards and other standards [3, 13, 14], the ability of the chosen disposal system to provide containment of the waste and to isolate it from people and the environment will be commensurate with the hazard potential of the waste. The requirements set out in this Safety Requirements publication apply to all types of disposal facility. However, the extent of provisions necessary to meet the requirements will vary in accordance with the graded approach. This is reflected in the Safety Guides for the different types of facility mentioned in para. 1.14.

Disposal facility life cycle

1.17. The development (i.e. site selection and evaluation, and facility design and construction) of most types of disposal facility is likely to take place over

extended periods of time. The period over which disposal facilities will be operated prior to closure will, in most cases, also extend over decades. Different activities will be conducted in this period of development, such as site selection and evaluation, and facility design and construction, with decisions being made to proceed to the next set of activities or the next step in the development of the facility.

1.18. Such a step by step approach enables: the ordered accumulation and assessment of the necessary scientific and technical data; the evaluation of possible sites; the development of disposal concepts; iterative studies for design development and safety assessment with progressively improving data; technical and regulatory reviews; public consultation and political decisions. However, the level of study and the process will depend on the facility and on national practices.

1.19. The step by step approach, together with the consideration of a range of options for the design and operational management of a disposal facility, is expected to provide flexibility for responding to new technical information and advances in waste management and material technologies. It also enables social, economic and political aspects of the disposal facility to be addressed, to ensure that all reasonable measures have been taken to further prevent, inhibit or delay releases to the environment.

1.20. This approach may include options for reversing a given step or even, for most types of facility, for retrieving waste after its emplacement, if this were considered to be appropriate.

1.21. The developers of disposal facilities may define a number of steps relating to their own programme needs. In this Safety Requirements publication, however, the step by step approach refers to the steps that are imposed by the regulatory body and by political decision making processes.

1.22. It is convenient to identify three periods associated with the development, operation and closure of a disposal facility: (i) the pre-operational period, (ii) the operational period and (iii) the post-closure period. Various activities will take place in these periods and some may be undertaken to varying degrees throughout part or all of the lifetime of the facility:

- (i) The pre-operational period includes concept definition, site evaluation (selection, verification and confirmation), safety assessment and design studies. It also includes the development of those aspects of the safety case

for safety in operation and after closure that are required in order to set the conditions of authorization, obtain the authorization and proceed with the construction of the disposal facility and the initial operational activities. The monitoring and testing programmes that are needed to inform operational management decisions are put in place.

- (ii) The operational period begins when waste is first received at the facility. From this time, radiation exposures may occur as a result of waste management activities, and these are subject to control in accordance with the requirements for protection and safety. Monitoring, surveillance and testing programmes continue to inform operational management decisions and to provide the basis for decisions concerning the closure of the facility or parts of it. Safety assessments for the period of operation and the period after closure and the safety case are updated as necessary to reflect actual experience and increasing knowledge. In the operational period, construction activities may take place at the same time as waste emplacement in, and closure of, other parts of the facility. This period may include activities for waste retrieval, if considered necessary, prior to closure, activities following the completion of waste emplacement and the final closure and sealing of the facility.
- (iii) The post-closure period begins at the time when all the engineered containment and isolation features have been put in place, operational buildings and supporting services have been decommissioned and the facility is in its final configuration. After its closure, the safety of the disposal facility is provided for by means of passive features inherent in the characteristics of the site and the facility and the characteristics of the waste packages, together with certain institutional controls, particularly for near surface facilities. Such institutional controls are put in place to prevent intrusion into facilities and to confirm that the disposal system is performing as expected by means of monitoring and surveillance. Monitoring may also be carried out to provide public assurance. The licence will be terminated after the period of active institutional control, when all the necessary technical, legal and financial requirements have been fulfilled.

1.23. This Safety Requirements publication is concerned with providing for the protection of people and the environment against the hazards associated with waste management activities relating to waste disposal, including hazards that could arise in the operational period and following closure. Assurance of this protection will be provided by the application of legal and regulatory requirements in the pre-operational and operational periods, and in some cases in the post-closure period.